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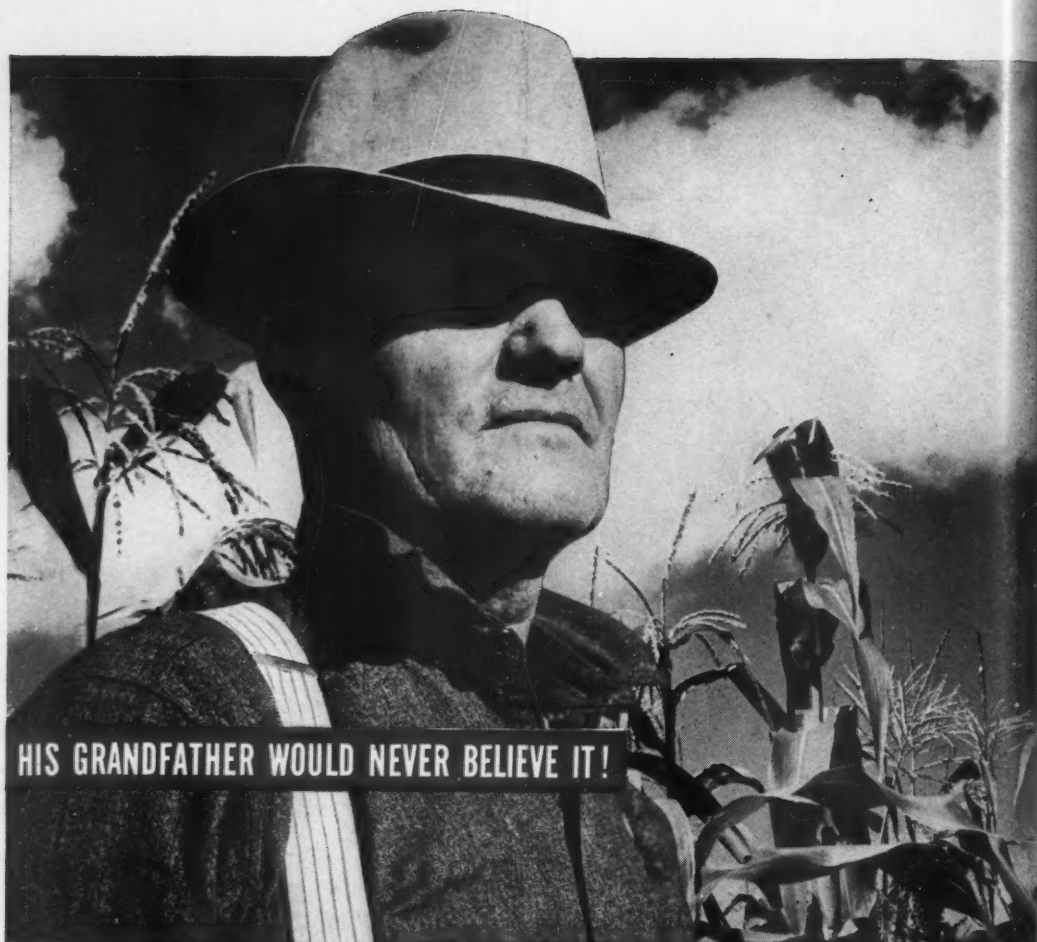
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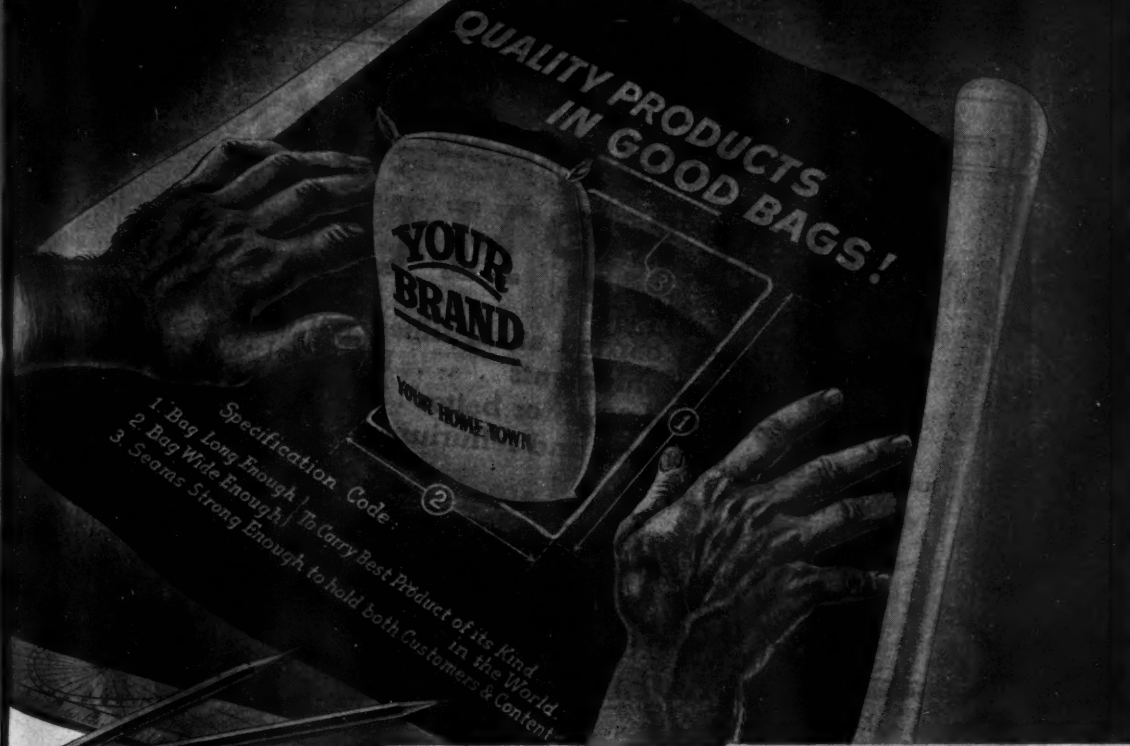
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See page 25



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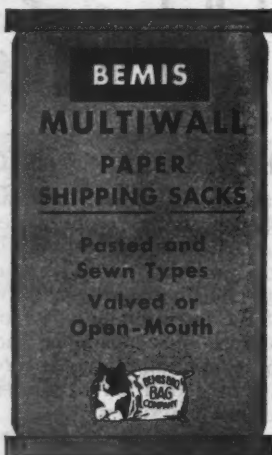
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AMERICAN FERTILIZER

"That man is a benefactor to his race who makes two blades of grass to grow where but one grew before."

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No. 7

The Role Played by Bags in the Storage of Ammonium Nitrate

By WILLIAM H. ROSS and J. Y. YEE

*Division of Soil and Fertilizer Investigations, Bureau of Plant Industry, Soils and Agricultural Engineering, Agricultural Research Administration,
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VARIOUS types of bags are now available for the shipment and storage of fertilizers and other commodities but those so far used for ammonium nitrate may be classed into two groups as follows:

1. Burlap bags with asphalt-attached creped and pleated paper lining on the inside.
2. Multiwall paper bags with one or two asphalt-laminated layers.

During the past year these two types of bags were used in large-scale storage tests with ammonium nitrate in different parts of the country. It was observed in the storage tests made in humid areas that the bags of the first type frequently became dripping wet while the bags of the second type, particularly those with two asphalt-laminated layers, remained dry. The ammonium nitrate in the bags that were dripping wet was found to be undrillable, whereas the material in unbroken multiwall bags with asphalt-laminated layers was usually in suitable condition for direct application in the field (6).^{*} The observations indicated that the moisture-resistant bags used in these large-scale storage tests differed greatly in their permeability to water vapor and in the protection that they afforded to ammonium nitrate stored under humid conditions. A study was accordingly undertaken of the relative permeability to water vapor of the different types of bags that are now being used or which might be used in the shipment and storage of ammonium nitrate.

Storage Tests with Ammonium Nitrate

In making these tests the bags were filled with granular ammonium nitrate that had been conditioned with 3.5 per cent of Kittitas to prevent caking. The tops of the bags were closed with plywood clamps that were bolted together in such a way as to insure against any leakage of water vapor through the closures. This method of closure also afforded a convenient means for opening and closing the bags for the removal of samples. The bags were stored in an air-conditioned room that was maintained at a temperature of 35°C. (95°F.) and a relative humidity of 80 per cent. An Indiana sampler was used to withdraw samples from different portions of each bag for moisture determinations at intervals of one month. The results obtained are given in Tables 1 and 2.

The results show that (1) ammonium nitrate in a new burlap bag with asphalt-attached creped and pleated paper lining will absorb twice as much moisture in one month under the conditions of the test as will a paper bag containing one 30-30-30# asphalt-laminated layer; (2) the permeability to water vapor of multiwall paper bags with one 30-30-30# asphalt-laminated layer is at least twice as great as that of bags containing two 30-30-30# asphalt-laminated layers of the same quality; (3) the permeability of the asphalt-laminated layers in certain makes of bags may be greater than that in other bags of the same type that contain a less weight of asphaltum; and (4) there is very little difference as a rule in the permeability to water vapor of burlap bags with

^{*} Numbers in parentheses refer to literature listed at the end of the article.

double asphalt layers and multiwall paper bags containing two asphalt-laminated layers.

The difference in water vapor pressure between the outside and inside of a bag of ammonium nitrate under the conditions of the test is equivalent to about 10.3 mm. of mercury (1, 5). The corresponding differential in pressure that would prevail in the case of bags of ammonium nitrate stored in commercial warehouses will differ greatly in different localities and in the same locality at

different seasons of the year as shown in Table 3. If it be assumed that the transmission of water vapor through a bag is proportional to the time of storage and to the differential vapor pressure between the outside and inside of the bag, then the period of storage in an air-conditioned room at 35° C. (95°F.) and a relative humidity of 80 per

TABLE 1

MOISTURE ABSORBED BY GRANULAR AMMONIUM NITRATE STORED IN MULTIWALL PAPER BAGS AT 95°F. AND A RELATIVE HUMIDITY OF 80 PER CENT

Bag No.	Type of Bag	Per Cent Moisture Absorbed	
		1 Month	2 Months
P-1	5-ply multiwall with 1/25-25-25% A-L-L ¹	1.25	.....
P-2	Duplicate of bag No. P-1.....	1.33	.....
P-3	5-ply multiwall with 1/30-30-30% A-L-L.....	1.67	.....
P-4	Duplicate of bag No. P-3.....	1.59	.....
P-5	6-ply multiwall with 2/25-25-25% A-L-L.....	0.44	1.07
P-6	Duplicate of bag No. P-5.....	0.22	.....
P-7	6-ply multiwall with 2/25-25-25% A-L-L.....	0.52	0.73
P-8	Duplicate of bag No. P-7.....	0.41	0.73
P-9	6-ply multiwall with 2/30-30-30% A-L-L.....	0.55	0.99
P-11	6-ply multiwall with 2/30-30-30% A-L-L.....	0.83	1.74
P-12	Duplicate of bag No. P-11.....	0.57	.....
P-13	6-ply multiwall with 2/30-30-30% A-L-L.....	0.69	1.25
P-14	Duplicate of bag No. P-13.....	0.65	0.92
P-15	6-ply multiwall with 2/30-30-30% A-L-L.....	0.81	1.37
P-16	Duplicate of bag No. P-15.....	0.75	0.98
P-17	6-ply multiwall with 1/30-100-30% A-L-L.....	0.33	0.65
P-18	Duplicate of bag No. P-17.....	0.17	0.51
P-19	6-ply multiwall with 2/30-60-30% A-L-L.....	0.12	0.25
P-20	Duplicate of bag No. P-19.....	0.07	0.25

¹Asphalt-laminated layer.

TABLE 2

MOISTURE ABSORBED BY GRANULAR AMMONIUM NITRATE WHEN STORED IN BURLAP BAGS OF DIFFERENT TYPES AT 95 F. AND A RELATIVE HUMIDITY OF 80 PER CENT

Bag No.	Type of Bag	Per Cent Moisture Absorbed	
		1 Month	2 Months
B-1	Burlap with asphalt-attached creped and pleated paper lining on inside.....	3.20	.....
B-2	Burlap with asphalt-attached single-creaked paper lining on inside.....	2.81	.....
B-3	30% crinkled kraft, 90% asphalt, 40" 10-oz. burlap, 90% asphalt, 30% crinkled kraft.....	0.70	1.12
B-4	Duplicate of bag No. B-3.....	0.79	1.06
B-5	40% creped kraft, 55% asphalt, 40" 10-oz. burlap, 55% asphalt, 40% creped kraft.....	0.38	0.56
B-7	40" 10-oz. burlap, 55% asphalt, 40% creped kraft, 55% asphalt, 40% creped kraft.....	0.34	.....
B-8	Duplicate of bag No. B-7.....	0.33	.....
B-9	40" 10-oz. burlap, 55% asphalt, 40% creped kraft, 55% asphalt, 40% creped kraft.....	0.57	1.00
B-10	Duplicate of bag No. B-9.....	0.47	0.90
B-11	40" 10-oz. burlap, 55% asphalt, 40% creped kraft, 55% asphalt, 40% creped kraft.....	0.58	1.17
B-12	Duplicate of bag No. B-11.....	0.09	.....
B-13	Burlap with asphalt-attached single-creaked paper lining on inside.....	1.69	.....

TABLE 3

AVERAGE DIFFERENTIAL IN VAPOR PRESSURE BETWEEN THE OUTSIDE AND INSIDE OF AMMONIUM NITRATE BAGS STORED IN DIFFERENT LOCALITIES FOR THE PERIODS INDICATED

Period of Storage	Place of Storage					
	Baltimore Md.	Raleigh N. C.	Memphis Tenn.	Norfolk Va.	Savannah Ga.	New Orleans La.
	mm. of Mercury					
January-March.....	-0.46	-0.28	-0.05	0.12	0.60	1.21
April-June.....	-0.29	0.24	0.64	1.27	2.12	2.19
July-September.....	1.32	2.55	2.44	3.31	4.47	4.06
October-December.....	-0.18	0.09	0.03	0.63	1.23	1.48
January-December.....	0.10	0.65	0.77	1.33	2.10	2.23

cent that will be equivalent in water vapor transmission to a storage period of one year (4) at each of the places listed in Table 3 will be as follows:

Place of One Year's Storage	Equivalent Storage Period in Room at 35°C. (95°F.) and a Relative Humidity of 80 per cent
Baltimore, Md.....	4
Raleigh, N. C.....	23
Memphis, Tenn.....	27
Norfolk, Va.....	46
Savannah, Ga.....	73
New Orleans, La.....	78

These results indicate that the two months' storage period to which the bags were subjected in the air-conditioned room at 35°C. (95°F.) and a relative humidity of 80 per cent is equivalent, with respect to moisture transmission, to storage for the greater part of a year in the most humid sections of the country. It is also apparent that a storage period of one month under the conditions stated is equivalent to one year or more in such places as Memphis, Tennessee; Raleigh, North Carolina; Baltimore, Maryland; and all points north (4).

The role played by bags in the storage of ammonium nitrate in humid areas was further demonstrated in a second series of tests. In these tests, granular ammonium nitrate that had been conditioned with 3.5 per cent of Kittitas was stored in the air-conditioned room at 35°C. (95°F.) and a relative humidity of 80 per cent for a period of two weeks. The temperature was then further increased and the humidity was lowered to 40 per cent for two days to cause a partial drying out of the material through the bags. Although all bags contained the same material and were treated in exactly the same way, their contents showed a marked variation in caking that was closely correlated to the permeability of the bags to water vapor. Thus the material in the bags that permitted a relatively high absorption of moisture and a corresponding loss of moisture during the drying period showed a marked degree of caking at the end of the test. Little or no caking, however, was found in bags that prevented any appreciable transmission of water vapor in either direction throughout the period of storage. This experiment shows very conclusively that the degree of caking that ammonium nitrate undergoes when stored in humid sections of

the country will depend in large measure on the permeability to water vapor of the bags in which it is stored.

Permeability of Bags to Water Vapor

The results obtained in these storage tests depended on the leakage or permeability to water vapor of the bags as a whole, rather than on that of the walls alone. A determination of the permeability to water vapor of the walls of bags of different types was made by means of a modification of the water vapor permeability cell as described by Carson (3). The permeability cell used in this

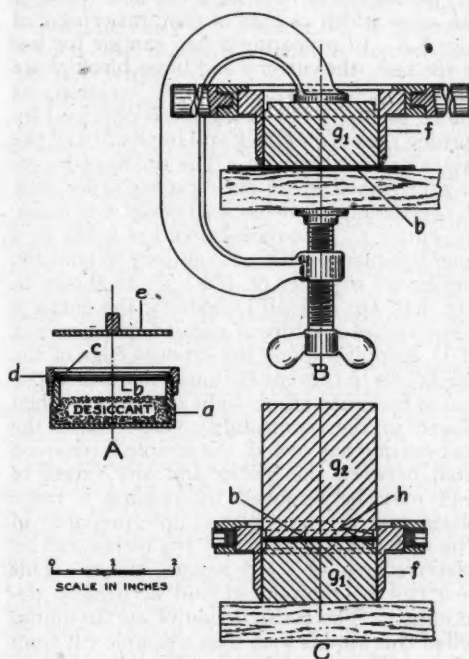


FIG. 1

- A. Water vapor Permeability Cell
- B. Device for Cutting Out Bag Samples for Permeability Cell
- C. Method of Aligning Cut-out Layers Prior to Waxing Edge of Bag Sample

determination is shown in cross-section in Fig. 1-A. The cell consists of an aluminum dish *a* with threaded top containing a desiccant; a bag sample that is cut in the form of a circular disc *b*; a brass ring *c*, 1/16 inch in width which serves as a bearing for the disc *b*; an open cap *d* that is capable of being screwed onto the dish *a* and making contact

with it through the medium of the ring *c* and the disc *b*; and a cover *e* for closing the cell while it is being weighed. The permeability cell when assembled is 2 inches in diameter and 1.25 inches high. This modified cell is so designed that samples from multiwall paper bags can be easily put in place or removed from the cell as desired.

A sample can be conveniently cut from the bag to be tested by means of the equipment shown in Fig. 1-B and 1-C. This equipment consists of a circular steel cutting device *f* having an internal diameter of $1\frac{7}{8}$ inches; and two cylindrical brass blocks *g*¹ and *g*² having such an external diameter that the cutter *f* will readily slip over them. Each of the blocks has at one end a cut-in recess *h* of the same width as that of the brass ring *c* of Fig. 1-A. In preparing a bag sample for use in the test, the cutter *f* and brass block *g*¹ are clamped in position by a "C" clamp, as shown in Fig. 1-B. A sample is obtained by turning the cutter *f* back and forth until all the layers are cut through. The different layers are then lined up in their proper order over the recessed end of block *g*¹ while it is inside the cutter *f*. The recessed end of block *g*² is then also placed within the cutter *f* to hold the bag layers together on block *g*¹, as shown in Fig. 1-C. On carefully removing the cutter *f*, a hot molten mixture of paraffin and beeswax (1:1) is applied along the exposed edge of the bag layers to prevent entrance of water vapor and to facilitate an air-tight connection when placed in the permeability cell. When the wax coating has cooled, the sample is removed from between the blocks and any excess of wax may be removed by passing a razor blade over it. The bag sample prepared in this way has a diameter of $1\frac{7}{8}$ inches and an effective area of 2.405 square inches. This area can be reproduced and accurately determined. The construction of an aluminum cell of this kind is such that a sample cut from a bag can be quickly mounted in place to give an air-tight connection and as quickly detached without the necessity of having to attach and remove a wax seal such as that described by Carson (3).

When making a test, about 8 grams of Anhydron is placed in the bottom of the dish *a* (Fig. 1-A), the bag sample and brass ring *c* are centered in place, and the open cap *d* is screwed on tightly to make an air-tight connection through the waxed edge of the bag sample which serves as a gasket. The entire assembly with the cover removed is then placed in a humidity chamber of the type described by Yee and Davis (7). The

humidity chamber is provided with a fan and contains a saturated solution of potassium sulphate. It is placed in a constant temperature room at 30°C. A saturated solution of potassium sulphate gives a relative humidity of 96.3 per cent at this temperature (1). The differential in water vapor pressure between the outside and inside of the bag sample under these conditions is equivalent to 30.7 mm. of mercury. The permeability of the bag sample under this differential of vapor pressure was determined every day for seven days. The gain in weight during the first three days while the bag sample was being saturated with moisture was discarded. During this period the gain in weight was excessive. A constant gain in weight was generally maintained during the rest of the experiment. The permeability of the sample was calculated from the average gain in weight during the last four days. It was expressed in terms of grams of water passing through a 100-square-inch area of the sample per 24 hours at 96.3 per cent relative humidity at 30°C. In order to offset irregularities in the bag, tests were made with six samples taken from different parts of the bag and the average taken for the true permeability.

The ordinary kraft layers of multiwall paper bags have little or no moisture-proofing value. This property as a rule is confined to the asphalt-laminated layers alone. However, some of the new wet-strength layers used in some types of bags seem to retard the passage of moisture through the wall to a slight extent. For this reason, all layers from each bag were used in the tests.

The results obtained by this method of determining the relative permeability to water vapor of bags of different types are given in Table 4 in comparison with the corresponding data in Tables 1 and 2. The data in Table 4 show that the two methods of testing place the bags in the same order when they differ considerably in their resistance to water vapor. Thus both methods of testing show that bags with a single asphalt layer are about twice as permeable to water vapor as those with two asphalt layers. The two methods of testing, however, do not always place the bags in the same order when the differences in their resistance to water vapor are not great. This is due to irregularities in different portions of the same bag and to imperfections in the bottom and longitudinal seams. Owing to these variations in bags of the same and of different types, the storage test is considered to be a more accurate test for each bag as a whole than the laboratory

(Continued on page 24)

The Proposed National Fertilizer Law Would Increase Costs of Fertilizers

By G. S. FRAPS

State Chemist of Texas

The proposed national fertilizer law would increase the cost of fertilizers to farmers, produce confusion in labeling of fertilizers, and interfere with state enforcement of state laws, without any compensating advantages.

The proposed law, H. R. 1823, introduced into the U. S. House of Representatives on January 29, 1945 by Mr. William Lemke of North Dakota, imposes a tax of 10 cents a ton and a registration fee of \$10.00 a brand upon fertilizers or fertilizer materials shipped in interstate commerce. As tax tags must also be attached to the packages, their cost and the cost of registration must be added to the tax. Fertilizers used for manufacturing purposes are not excluded and presumably would be subject to the tax also. The net result would be an increase in cost of fertilizer to the farmers and an additional burden upon the fertilizer industry with nothing gained to compensate.

As these taxes are applied only to goods shipped in interstate commerce, and are not applied to manufacturers who do business within a state, they may be in conflict with the U. S. Constitution. Section 8, Article 1 provides that duties, imports and excises must be uniform. Some manufacturers in a state would be subject to the tax and some would not. Section 8, Article 5, provides that no tax or duty shall be laid upon articles exported from a state. These proposed taxes are expressly on fertilizers shipped from one state to another, and would therefore be a burden upon interstate commerce.

Laws controlling the sale of fertilizers have been passed in practically all states in which any appreciable amounts of fertilizer are sold. Many of these laws were originally passed a number of years ago. The first fertilizer law in Texas was passed in 1899, and it was not one of the earliest. The laws have been changed from time to time to adapt them to changing conditions. The present Texas law was enacted in 1911. These laws amply control the fertilizer situation and there is no need for any Federal law.

The revenue to enforce the state laws comes in some states from a tonnage tax, in other states from a registration fee, and in a few states, from both. Under present court decisions, the imposition of the Federal tax would not affect the rights of the states to inspect interstate shipments and to tax them for this purpose, but the courts might decide differently if a Federal law is enacted. In such case, the states would be deprived of needed revenue.

The information on the labels required is not the same in every state, being what the legislature of each state considers best for its local needs. It can be presumed that the legislature of each state knows what best suits that particular state. The result of the Federal law would be that interstate shipments would at first be labeled differently from fertilizer manufactured in the state. These differences in labeling would lead to confusion and litigation, unless and until the various states changed the state requirements to be uniform to the Federal requirements for labeling and give up their right to decide what is best for their own state.

One requirement of the proposed law is a guaranteed analysis of the minimum percentage of available nitrogen, the maximum percentage of water-soluble nitrogen and the minimum percentage of organic nitrogen. There is no method of analysis for determining available nitrogen. It is not in the Methods of the Association of Official Agricultural Chemists and is not being studied. The quality of the nitrogen in fertilizers is usually safeguarded by excluding nitrogenous material of low availability. This is, in fact, attempted in the proposed Federal law by excluding ground leather, hair, etc. Thus all the nitrogen in the fertilizer has a good availability. The term "available nitrogen" might thus mean total nitrogen and it might mean something else but in any case, the term is indefinite. Some of the organic nitrogen is water-soluble and thus would be counted three times, once as organic and a second time as water-soluble and a third time as the "available" nitrogen.

Such labeling as regards nitrogen would be confusing and misleading and is thus highly undesirable. The nitrogen could be stated as water-soluble and water-insoluble, or as organic and inorganic, but the two classifications should not be jumbled together.

The proposed law also requires that the amounts or analysis of each material or source of each plant-food element used in the manufacture of the fertilizer mixture containing two or more plant-food elements be stated in pounds per 100 pounds of mixture. This requirement is not clear but it may mean the requirement present in the laws of South Carolina, but which is not present in those of any other state and is not desired by other states. The Federal law thus proposes to impose on all other states, whether they want it or not, the labeling requirements of South Carolina.

The provision referred to means that if a manufacturer changes ingredients from 18 per cent superphosphate to 20 per cent superphosphate, or from 50 per cent muriate of potash to 60 per cent muriate of potash, or vice versa, he would be required to have different tags printed and attached to his goods. Any change in the materials used would require different tags. Such changes mentioned would not affect the fertilizing value of the fertilizer, because one source of plantfood would be as good as another. In fact, the use of good sources of plantfood is insured by other provisions of the state laws. This portion of the law would add to the cost of manufacture, without any desirable advantages. Manufacturers have to use the fertilizing materials that are available in order to produce fertilizers at the lowest possible price. The important thing in a fertilizer law is to insure that the plant food is present in available forms, and this is taken care of in other sections of the various state laws. The labeling requirement referred to is highly undesirable.

Dr. Harvey W. Wiley, who was considered to be the father of the National Food and Drug law, also investigated the desirability of a national fertilizer law. If he had found such a law to be desirable, he would have consulted fertilizer manufacturers, state officials, farm leaders and research specialists, and with their advice and cooperation, he would have drawn up a national fertilizer law that would supplement the state laws and not interfere with them, and that would contain sane and sound requirements. Dr. Wiley found, however, that a national fertilizer

law was not needed. What Dr. Wiley found about 1910, is likewise true in 1945. The state laws amply control fertilizers, and require labeling suited to their local needs. The labeling requirements for fertilizers should remain with the state legislature, as it is now, and not be removed to a central authority, as is proposed in H. R. 1823 by Mr. Lemke of North Dakota.

Tank Car Demurrage Extended

Increased demurrage charges on tank cars applied by the Interstate Commerce Commission on January 22nd, to expire March 31st, have been continued till June 1st at the request of the Office of Defense Transportation. J. Monroe Johnson, Director of ODT, states that the railway tank car situation continues critical.

Under the order, the time a loaded tank car may remain on tracks at point of destination, was reduced from 48 to 24 hours. After the expiration of 24 hours, a demurrage charge of \$11 per car per day for the first five days and \$22 per day for each subsequent day the car is held will be made.

February Sulphate of Ammonia

Production of by-product sulphate of ammonia maintained during February the average output of about 2,200 tons per day, according to the figures of the U. S. Bureau of Mines. This level has been reached almost every month of the war period. Shipments again totaled 75,000 tons during the month, and as a result the stocks on hand at producers' plants had decreased by the end of the month to about 47,000 tons. This figure would have been even lower if there had been sufficient box cars available to fill accumulated orders.

	Sulphate of Ammonia Tons	Ammonia Liquor Tons NH ₃
Production		
February, 1945.....	62,504	2,260
January, 1945.....	67,331	2,513
February, 1944.....	64,556	2,599
Jan.-Feb. 1945.....	129,835	4,773
Jan.-Feb., 1944.....	132,432	5,342
Shipments		
February, 1945.....	75,885	2,186
January, 1945.....	75,981	2,106
February, 1944.....	63,861	2,465
Stocks on hand		
February 28, 1945.....	46,979	1,024
January 31, 1945.....	60,381	1,080
February 29, 1944.....	25,533	822
January 31, 1944.....	25,045	865

IT MAY BE

By SAMUEL L. VEITCH

Production

The lid has been officially clamped on postwar surplus food talk. There are two reasons for that. First, the postwar relief commitments and, second, the fear that farmers might start reductions too soon. It may be, there is little probability of a serious food surplus until after Europe has harvested one good crop; not before 1946 at the earliest. It'll be important to keep that in mind when "surplus" talk is revived after Germany collapses.

Military Requirements

Military requirements will continue to take all available meats, dairy products, chickens, fats and oils, even after Germany is defeated. That is unless unemployment cuts deeper than expected into civilian buying. To counteract food surplus talk WFA Administrator Jones recently again urged farmers to plant up to their full goals; he also promised labor help from 30,000 German prisoners, plus 70,000 free foreign workers.

Prices

The Senate Banking and Currency Committee expects to wind up consideration of the OPA extension bill and report it to the floor without major changes. Industry representatives generally urged extension of price control legislation but complained bitterly against administration methods and policies. Committee reports accompanying the bill will call OPA'S attention to the need for changes in administration to meet criticism which several members of the committee said they felt was justified.

Labor

War Food Administration will have a new Director of Labor shortly when Lt. Col. Wilson R. Buie succeeds Brig. Gen. Philip G. Bruton, head of the labor division since June, 1943. Jones, in announcing the change, tossed Gen. Bruton a bouquet for having "performed an outstanding service in directing one of the more difficult phases of WFA operations." He returns to active Army duty. Col. Buie

will take over at a time when the farm labor supply is at the lowest point for this time of year in the 21 years in which records have been kept, about 150,000 under March of last year.

Deferment

Procedure for deferment of essential workers in most food industries has been developed by Selective Service and WFA. Selective Service authorized WFA to certify requests for occupational deferment of men under 30 employed in fruit and vegetable processing, including canning, preserving, freezing, drying and packing; meat packing and poultry packing and dressing; processing of cotton and other fibers; tobacco, grain products, including bakeries; dairy products and fats and oils processing, sugar processing; *fertilizer manufacture*; car icing and ice harvesting and manufacture.

Under the regulations WFA can certify for deferment 30 per cent of the men in those industries who were 2-A or 2-B on January 1st.

Transportation

The Nation's freight transportation situation is critical and no material improvement is in prospect. The grain situation was termed particularly alarming with great quantities of wheat still to be transported. A large amount of high-moisture corn must be moved to avoid severe damage and new wheat is only three months away.

Cotton

The International Cotton Advisory Committee, with ten cotton producing nations represented, in a recent meeting in Washington began to lay the groundwork for a probable later full-dress meeting of the International Cotton Council.

The committee exchanged data on cotton production and consumption, showing that supplies are in excess of demand, and further indicating that postwar international agreements will be necessary to prevent world surpluses.

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Secretary of Agriculture Dis- approves of Hill Fertilizer Bill

IN A REPORT to the Senate Committee on Agriculture and Forestation, Secretary of Agriculture Claude R. Wickard has indicated the disapproval by the Administration of the Hill Fertilizer Policy Bill (S. 74) which is being considered by that Committee. While favoring the general objectives of the bill, Secretary Wickard characterized it as "not being in accord with the program of the President."

The Hill bill proposes legislative action along three significant lines:

1. It directs the Tennessee Valley Authority to formulate and report to Congress within six months a national fertilizer policy and program.

2. It authorizes TVA to acquire phosphate lands in Florida sufficient to supply the Mobile plant and Muscle Shoals plants for fifty years.

3. It sets forth policy which shall govern the operation of the Mobile phosphate plant after its construction, which is that, after five years, it is to be turned over to a farmers' cooperative for operation for the next fifty years under lease from TVA.

The objections made to the Hill bill by Secretary Wickard were much the same as those expressed last year on a similar measure of the senator (S. 2035), although not in as great detail. For example, no question was raised to the advisability of the government's exercising unlimited authority to buy or lease phosphate reserves in Florida, or the effect that such action might have on private industries now established and operating in the area. Nor did Mr. Wickard repeat his favorable comment of last year on fertilizer prices or the fact that the quality of fertilizers has improved materially in recent years.

On the whole the report of the secretary, although unfavorable to the Hill bill, was less favorable from the standpoint of the interests of private fertilizer manufacturers than was his last year's report, not by what is contained in the report but rather by what was left out of the comments of the secretary on the legislation. As a part of the report, the secretary included the recommendation of his Committee on National Fertilizer and Lime Policy of last February which called for greatly increased production of fertilizers through government aid in research and production. These, he believed, point in the

direction which the national postwar policy for fertilizer and liming materials should take. The recommendations of the committee will have to be implemented by various means, and he said that the department expected to follow through on the matter and do all it could to insure that the various fertilizer problems get the attention they deserve.

Mr. Wickard's principal objection to the Hill bill was that it left the matter of determining a national fertilizer policy up to TVA, rather than to the Department of Agriculture which he insisted is the more appropriate agency to perform this work and carry out a program because of its experience in dealing with fertilizer matters on a national scale. The experience of TVA, he said, has been largely in technology and production and limited primarily to phosphates. It has had but little experience in production of potash fertilizer. Its limited experience in fertilizer use on a national basis would not seem adequate, he said, for the formulation of a national policy that would influence the production and use of all kinds of fertilizers, in all sections of the country, on all types of crops.

Mr. Wickard said that the department favors the general objectives of the bill, but does not believe the methods proposed for arriving at these objectives are wholly satisfactory for the overall agricultural interests of the country. He concluded: "Consideration needs to be given to the whole program of insuring adequate use of fertilizer and liming materials and their availability where needed at prices in keeping with efficient production and distribution."

War-Prison Labor for Agriculture

The War Department has announced that an additional 100,000 German prisoners will be brought to the United States and that about 100,000 war prisoners are expected to be available for farm work at this year's harvest peak. This is about 30,000 more than were used for the purpose last year.

Ammonia Bureau Changes Name

The name of the Educational Research Bureau for By-product Ammonia has been changed to Coke Oven Research Bureau. The organization has its main office at 50 West Broad Street, Columbus, Ohio.

Davison Appoints Charles J. Brand Consultant to Its President

Chester F. Hockley, president of The Davison Chemical Corporation, Baltimore, has announced the appointment of Charles J. Brand, for nearly 20 years executive secretary and treasurer of The National Fertilizer Association and recently retired, as consultant to the president, effective May 1, 1945.

In announcing the selection of Mr. Brand, Mr. Hockley emphasized the fact that postwar problems and conditions in the chemical field will call not only for a high order of industrial, technical, and business skill, but also for careful appraisal of trends and prospects in agricultural and governmental relations.

With 20 years of responsible research, administrative and consultative experience in the U. S. Department of Agriculture, and a like period managing the national trade association covering the whole field of the chemical fertilizer industry, Mr. Brand comes into the consulting field unusually well equipped.

Barrett Promotions Announced

The appointment of Roy S. Marsden as manager, Nitrate Sales, has been announced by The Barrett Division, Allied Chemical and Dye Corporation. Mr. Marsden started with the company as a division sales manager in 1936, and has recently held the position of assistant manager, Fertilizer Sales. He is a native of the South, having been born in Virginia, and has lived in the South most of his lifetime.

The appointment of William H. Mortimer as manager, Sulphate of Ammonia Sales, has also been announced. Mr. Mortimer started with the company in 1918, and has recently held the position of assistant sales manager.

Another appointment is that of Walter S. Colvin as district sales manager of its New York territory. Mr. Colvin has been in the employ of Barrett for four and one-half years, is a native of Rhode Island, and a graduate of Rhode Island College and of Massachusetts State College.

A study of cotton farms in South Carolina revealed that small farms made the lowest yields. The small farm had less to sell and it cost more per pound to produce the cotton.

New Allocation of Potash

The War Production Board has issued Schedule 98 to M-300 and has revoked Allocation Order M-291, without materially changing allocation procedures.

Allocation period 4 extends from June 1, 1944 to March 31, 1945. Period 5 is April 1, 1945 to May 31, 1945. Period 6 is June 1, 1945 to March 31, 1946. Period 7 is April 1, 1946 to May 31, 1946.

Exemptions on small orders for each person is 50 tons (K_2O) for even number periods, and 10 tons for each odd number allocation period.

Fertilizer manufacturers must file an application in triplicate with the War Production Board, on Form WPB-2945, stating the uses to be applied. Applications must be filed May 1st before even numbered allocations and January 15th before odd numbered allocation periods.

Suppliers seeking authorization to deliver potash salts must file with WPB in triplicate, Form 2946, specifying an aggregate quantity desired without specifying customers' names for delivery on exempt small orders. Filing dates for applications are July 7th before even numbered allocation periods and March 28th before odd numbered allocation periods.

Any potash not used during the period for which it is allocated may be used at any time thereafter, but this does not apply to the undelivered parts of allocations at the end of each period.

Suppliers may deliver to any person in advance of the next allocation period, up to 20 per cent of the purchaser's allotment, but amounts so delivered must be deducted from the amounts permitted for the next allocation period.

Exemptions from applications and specific authorization shall not be required for the following:

1. Delivery of potash to any person who is not a producer or importer of potash. However, a person who receives potash from a producer or importer pursuant to specific authorization shall deliver it only in accordance with the authorization.

2. Acceptance of delivery of potash from any person who is not a potash producer or importer.

3. Use of potash received from any person who is not a potash producer or importer, provided that the user is not a fertilizer manufacturer or a potash producer or importer.

Fulton Bag Acquires Denver Plant

The Fulton Bag and Cotton Mills, with headquarters in Atlanta, Ga., announce purchase of the assets of the Grimes Bag Company at Denver, Colorado. The company took possession on April 2nd and Eugene Revelle, for many years in charge of the Denver office, will be the manager.

The year 1945 marks the 75th anniversary of Fulton Bag and Cotton Mills, one of the nation's leading manufacturers of textile bags, established first in Atlanta, Ga., where the main plant and home office are located. In Atlanta are the company's cotton mills and finishing plant. Branch bag factories are in New Orleans, Dallas, St. Louis, Kansas City and Minneapolis. Addition of this bag factory in Denver will enable the company to give better service to bag consumers in the Western territory.

"New knowledge on farming from your agricultural college is a surer form of farm relief than may be had from Congress."

—S. C. Agricultural Extension Service.

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FERTILIZER MATERIALS MARKET

NEW YORK

Little Change in Fertilizer Materials Situation. Demand Absorbing All Available Supplies. Lack of Shipping Facilities Hampers Most Manufacturers. Superphosphate Shortage Still Serious. Export Demand for Phosphate Rock Expected.

Exclusive Correspondence to "The American Fertilizer"

NEW YORK, April 5, 1945.

Sulphate of Ammonia

Production of this material has continued at high levels but shipments continue to be handicapped by the shortage of box cars which has prevailed all winter. The warm weather, which has brought an early demand for mixed fertilizers, has increased the calls for sulphate of ammonia, but, in spite of this, the shipping season should extend beyond the usual limits.

Nitrate of Soda

There have been no new developments in nitrate of soda. All production and imports are moving steadily to consumers and the price levels have been maintained. It is estimated that imports of Chilean nitrate will reach 850,000 tons for the present fertilizer year, an increase of 200,000 tons over the preceding year.

Organic Ammoniates

The organic situation continues as tight as ever. The feed market is taking all offerings at prices beyond the fertilizer level. As a consequence, those organics not suitable for feeding purposes are bespoken far in advance of production.

Phosphate Rock

Miners have been able to keep acidulators supplied with all the rock they could handle throughout the past months. There have been some transportation difficulties. With the end of the European war in sight, export inquiries are developing and producers expect considerable foreign demand when hostilities cease.

Superphosphate

No improvement in the superphosphate shortage is expected this season. In every

section of the country demand is running far ahead of the tonnage that producers are able to manufacture. While a shortage of sulphuric acid has been the major problem, most factories have also had to contend with a serious manpower shortage, as well as transportation difficulties.

Potash

Potash producers are finishing up a season in which they have done a most praiseworthy piece of work. In spite of transportation and labor problems, production has been steadily maintained at record levels and no serious shortages have occurred, except in the case of sulphate of potash for tobacco fertilizers. It is expected that shipments will continue later than usual as the demand for mixed goods holds up.

CHICAGO

Little Current Business in Fertilizer Organics. Low Livestock Receipts Curtail Supply of Feeding Materials.

Exclusive Correspondence to "The American Fertilizer"

CHICAGO, April 4, 1945.

Surface activity in organics remains at low ebb. Uncertainty over future productions handicaps new business.

In feeds, too, supplies are in tight position, demand holding good, and production light. Receipts of live hogs continue very small, limiting production of wet and dry rendered tankage. Ceiling prices are firmly maintained.

Ceiling prices are:

High grade ground fertilizer tankage, \$3.85 to \$4.00 (\$4.68 to \$4.86 per unit N) and 10 cents; standard grades crushed feeding tankage, \$5.53 per unit ammonia (\$6.72 per unit N); blood, \$5.53 (\$6.72 per unit N); dry rendered tankage, \$1.25 per unit of protein, f. o. b. producing points.

Fertilizer Materials



Let us Quote on YOUR Requirements

PHOSPHATE ROCK
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 Havana, Cuba
 Houston, Texas
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Wilmington, N. C.

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 New Orleans, La.
 New York, N. Y.
 Norfolk, Va.
 Presque Isle, Me.
 San Juan, P. R.
 Sandusky, Ohio

CHARLESTON

Early Demands for Fertilizer and Lack of Labor Complicates Situation. Shortage in Organics and Superphosphate Continues.

Exclusive Correspondence to "The American Fertilizer"

CHARLESTON, April 4, 1945.

All the manufacturers in the Southeast complain of being behind on their shipping, due to lack of labor, and the farmers calling earlier for material.

Organics.—These are practically unobtainable at present.

Dried Blood.—A good deal of business offering at the selling price, \$5.53 per unit of ammonia (\$6.72 per unit N), f. o. b. Chicago, but no quotations.

Sulphate of Ammonia.—Shipping instructions on this continue heavy. Movement is delayed on account of the shortage of box cars, even though the producers have the material on hand.

Superphosphate.—This continues extremely scarce in spite of any statistics to the contrary.

jurisdiction. It is not interested in entering general commercial competition, but believes it desirable to maintain the right to buy potash for experimental and other purposes. For example, the government now is a distributor on an experimental basis of certain types of fertilizer. There is a bill pending (S. 74) which contemplates even broader activity in this field. The government's ability to have potash for this purpose is obviously important.

"It might be pointed out that section 3(d) merely reserves a right to buy, and then only after ample notice and on payment of prevailing prices. It does not follow that the lessor would necessarily avail himself of this provision. The section was inserted in part because it is our understanding that trade practices in the potash industry are such that the government might not find it possible to secure the supplies of potash which it desires without some such provision in its lease. It should be noted, too, that the law itself authorizes the government to take its royalty in cash or in kind."

Government Option on Potash

Under the plan of leasing government-owned land for developing potash deposits, provision is made for the government to have an option on a portion of all potash produced.

The position taken by the Department of the Interior has been officially explained as follows:

"Section 3(d) of the form of lease of the new potash regulations, which is a revision of part 194 of title 43 of the Code of Federal Regulations, would permit the government to buy some of the mineral taken under a potash lease. This department is interested in the widest use of mineral resources under its

Insecticide Bombs

The aerosol bomb developed by scientists of the United States Department of Agriculture is used in the application of insecticides. The bomb is a small metal dispenser which releases the insecticides under pressure so that they become a fine fog or mist. They are not yet available to civilians, but more than 14 million of these "bombs" were distributed to combat areas in 1943 and 1944 to help protect the armed forces against mosquitoes and malaria.

After the war it is expected they will find wide use in combating not only mosquitoes, but the cotton boll weevil, orchard insects, other crop pests, and even house flies.

Manufacturers' Sales Agents for **DOMESTIC**

Sulphate of Ammonia

Ammonia Liquor

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Anhydrous Ammonia

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State Department Views on Government Nitrogen Plants

On April 3rd the Department of State issued the following press release regarding Government nitrogen plants:

During the course of the Inter-American Conference on Problems of War and Peace at Mexico City, discussions were held between the United States and Chilean delegations regarding the operation and disposal of synthetic nitrogen plants owned by the Government of the United States.

As a result of those discussions the Secretary of State informed the Minister of Foreign Affairs of Chile that it was not the intention of the Government of the United States that the production by the Government of synthetic nitrogen plants owned by it and constructed for war purposes, should be continued beyond the period necessitated by the conditions or consequences of the war, except as might be necessary in order to maintain the plants in efficient operating condition for national security from the point of view not only of physical condition but also for the purpose of continuing scientific research and technological progress. The Chilean Minister of Foreign Affairs was also informed that should it be necessary for the Government of the United States to modify this position, there would be consultation with the Government of Chile before action was taken.

The Secretary of State also informed the Foreign Minister of the intention of the Government of the United States to consult with the Government of Chile with respect to such Government plants for the production of synthetic nitrogen, constructed for war purposes, as might not be dismantled, or

converted to uses other than the production of synthetic nitrogen, or maintained for national security, if the terms or conditions of cession, sale, or lease of such plants to private interests might create serious problems affecting the production or exportation of Chilean nitrates. Such consultation would be for the purpose of reaching such accord with respect to those problems as would, while protecting the interests of the United States Government, give due consideration to the effects upon Chile, particularly from the point of view of the competitive situation created by the terms or conditions of the cession, sale, or lease of those plants.

Stauffer Expansion Sulphuric Acid Plant, Hammond, Ind.

Stauffer Chemical Company, New York, reports plans for increasing its Hammond, Indiana, sulphuric acid plant. A building to accommodate the expansion is expected to be completed by July 1st of this year. Officials of the company are quoted as saying that the expansion is for meeting increasing wartime demands and to provide for post-war activities.

CLASSIFIED ADVERTISEMENTS

Advertisements for sale of plants, machinery, etc. and for help and employment, in this column, same type as now used, 60c per line, each insertion.

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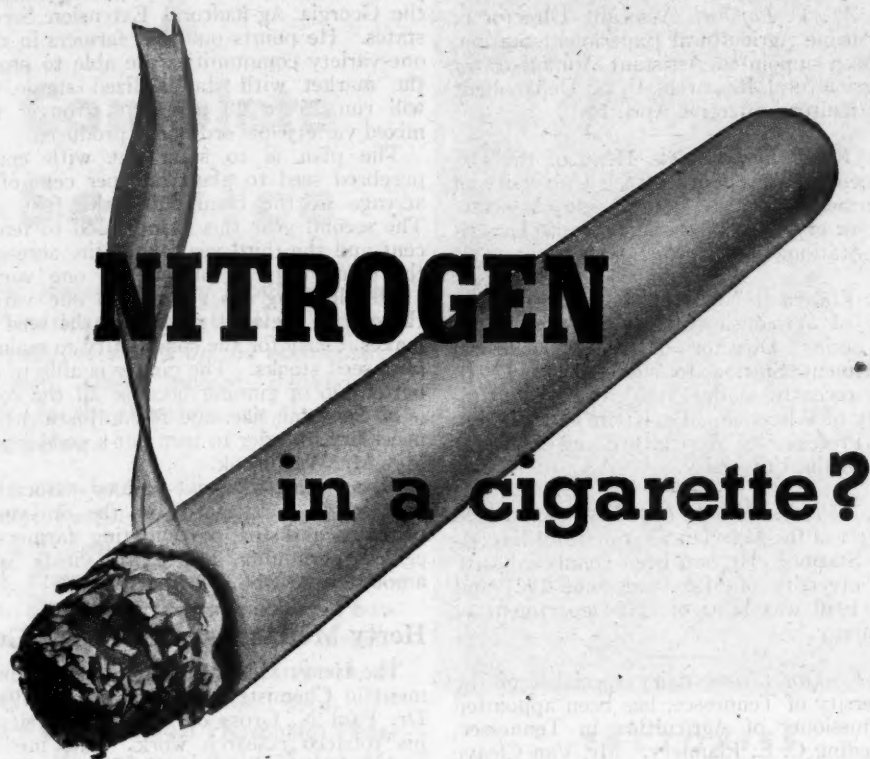
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SURE, there's nitrogen in that cigarette... in any cigarette.

Tobacco quality—in fact, efficient production of the crop itself—depends on the right amount and the right kind of nitrogen.

Of course, right now, nitrogen has a big war job. Therefore, much of the nitrogen that normally goes into Du Pont Urea-Ammonia Liquors and "Uramon" Fertilizer Compound is no longer obtainable for this purpose.

But now is the time to study the uses of urea nitrogen. This type of nitrogen is especially ideal for tobacco and for most other

growing crops. Consult with our service representatives at your convenience. Write E. I. du Pont de Nemours & Co. (Inc.), Ammonia Dept., Wilmington 98, Delaware.

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BETTER THINGS FOR BETTER LIVING... THROUGH CHEMISTRY

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Personal Mention

Dr. W. V. Lambert, Associate Director of the Purdue Agricultural Experiment Station, has been appointed Assistant Administrator of Agricultural Research, U. S. Department of Agriculture, effective April 16th.

Dr. R. P. Bartholomew, Head of the Department of Agronomy of the University of Arkansas, has also been made Associate Director of the Arkansas Agricultural Experiment Station.

Dr. Vincent E. Kivlin has been made acting Dean of Wisconsin College of Agriculture and acting Director of the Agricultural Experiment Station to succeed Dr. E. B. Fred, recently made President of the University of Wisconsin. Dr. Kivlin had formerly been Professor of Agriculture and Assistant Dean of the University.

Dr. W. P. Kemp has been appointed Director of the Maryland Agricultural Experiment Station. He had been connected with the University of Maryland since 1921 and since 1940 was head of the Department of Agronomy.

O. E. Van Cleave, dairy specialist of the University of Tennessee, has been appointed Commissioner of Agriculture in Tennessee, succeeding C. E. Flannery. Mr. Van Cleave had served as Agricultural Commissioner previously.

Wm. B. Ward has been appointed Editor and Chief of Publications of Cornell University, succeeding Bristow Adams, dean of Agricultural College Editors, who has retired. Mr. Ward had recently served with the information section of the War Food Administration.

Cotton Returns from One-Variety Plan

Cotton growers in more than 2,500 communities throughout the South will join this year in improving the quality of their cotton through the one-variety cotton improvement

plan, E. C. Westbrook, cotton specialist of the Georgia Agricultural Extension Service, states. He points out that farmers in these one-variety communities are able to provide the market with standardized staple that will run 15 to 20 per cent stronger than mixed variety lots ordinarily produced.

The plan is to start out with enough purebred seed to plant one per cent of the acreage in the community the first year. The second year this is increased to ten per cent and the third year the entire acreage of the community is planted to one variety.

"By limiting his ginning to one variety, the ginner prevents mixing of the seed and makes it easy for the community to maintain pure seed stocks. The ginner is able to do a better job of ginning because all the cotton is of the same size, and few adjustments are necessary in order to turn out a good grade" says Mr. Westbrook.

"Last year, 229 one-variety associations in Georgia participated in the one-variety program and the participating farmers received premiums and extra yields which amounted to \$14.30 per acre."

Herty Medal Awarded to Dr. Gross

The Herty Medal for outstanding achievement in Chemistry was awarded for 1945 to Dr. Paul N. Gross of Duke University for his tobacco research work. The medal is awarded annually by the Chemistry Club of the Georgia State College for Women in honor of the late Charles H. Herty, noted chemist.

Duke University will grow Turkish tobacco experimentally in several counties in the western part of North Carolina, each farmer having a half-acre plot.

"This production (postwar production) can be continued only if we have all-out industrial production as well. There cannot be curtailment of industrial production and at the same time abundant agricultural production. The two furnish a market for each other."—*Marvin Jones, War Food Administrator.*

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We manufacture all grades of Commercial Fertilizers, Superphosphate, Agrinite Tankage, Bone Black, Bone Black Pigments (Cosmic Black), Dicalcium Phosphate, Monocalcium Phosphate, Gelatin, Agricultural Insecticides (including Pyrox, Arsenate of Lead, Calcium Arsenate, etc.), Trisodium and Disodium Phosphate, Phosphorus, Phosphoric Acid, Sulphuric Acid, Salt Cake; and we are importers and/or dealers in Nitrate of Soda, Cyanamid, Potash Salts, Sulphate of Ammonia, Raw Bone Meal, Steamed Bone Meal, Sheep and Goat Manure, Fish and Blood. We mine and sell all grades of Florida Pebble Phosphate Rock.



FACTORIES

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Baltimore, Md.	East St. Louis, Ill.	Pierce, Fla.
Buffalo, N. Y.	Greensboro, N. C.	Port Hope, Ont., Can.
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Cayce, S. C.	Henderson, N. C.	Searsport, Maine
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Carteret, N. J.	Greensboro, N. C.	New York, N. Y.	Spartanburg, S. C.
Charleston, S. C.	Havana, Cuba	Norfolk, Va.	Wilmington, N. C.
Cincinnati, Ohio	Henderson, N. C.	No. Weymouth, Mass.	
Cleveland, Ohio	Houlton, Me.	Pensacola, Fla.	

THE ROLE PLAYED BY BAGS IN THE STORAGE OF AMMONIUM NITRATE

(Continued from page 10)

permeability test. It has been observed that when bags show irregularities in different parts of the same bag, results obtained in duplicate tests and with the two different methods of testing do not show as close agreement as in the case of bags that have more uniform construction.

TABLE 4

RESISTANCE OF BAGS OF DIFFERENT TYPES TO WATER VAPOR TRANSMISSION AS DETERMINED BY PERMEABILITY AND STORAGE TESTS

Bag No.	Weight of Asphalt	Permeability Expressed in Gms. of Water per 100 sq. in. per 24 hrs. ¹	Moisture Absorbed per Month in Storage Test ²
Per Cent			
Bags with Single-Asphalt Layer			
P-17.....	1/100 #	0.87	0.33
P- 1.....	1/25 #	1.50	1.25
P- 4.....	1/30 #	1.50	1.59
B-13.....		1.98	1.69
B- 2.....		2.59	2.81
B- 1.....		2.65	3.20
Bags with Double-Asphalt Layers			
P-19.....	2/60 #	0.42	0.12
P- 9.....	2/30 #	0.45	9.55
B-11.....	2/55 #	0.65	0.58
P-15.....	2/30 #	0.71	0.81
B- 7.....	2/55 #	0.73	0.34
P- 7.....	2/25 #	0.74	0.52
B- 5.....	2/55 #	0.80	0.38
B- 9.....	2/55 #	0.83	0.57
P- 5.....	2/25 #	0.87	0.44
P-13.....	2/30 #	1.00	0.69
B- 3.....	2/90 #	1.04	0.70

At 30°C. (86°F.) and a relative humidity of 96 per cent.

²At 35°C. (95°F.) and a relative humidity of 80 per cent.

Light Penetration Test

While storage in an air-conditioned room under carefully controlled conditions is the most reliable method for comparing the relative permeability to water vapor of bags of different types, this can be approximated very closely by a much more rapid method that has recently been developed in this laboratory. The method consists in placing a portion of the bag or of an asphalt-laminated layer over a ground glass window in a box that contains a bright light. When different bags are examined in this way in a dark room they often present a very different appearance as shown by the photographs in Fig. 2. These photographs were made by exposing,

over a printing box, a sensitive film placed in contact with a section of a burlap bag or an asphalt-laminated layer in a printing frame. The bags represented in the different photographs shown in Fig. 2 are as follows:

A. Burlap with asphalt-attached creped and pleated paper lining on inside. Bag No. B-1 of Table 2. Used in large-scale storage tests.

B. Asphalt-laminated layer from 5-ply multiwall paper bag No. P-1, Table 1. Used in large-scale storage tests.

C. Asphalt-laminated layer from 5-ply multiwall 1/90# asphalt-laminated paper bag No. P-3, Table 1.

D. Single asphalt-laminated layer from 6-ply multiwall 2/75# asphalt-laminated paper bag No. P-5, Table 1, crumpled.

E. 40# creped kraft, 55# asphalt, 40# 10-oz. burlap, 55# asphalt, 40# creped kraft, bag No. B-5, Table 2.

F. Two 75# asphalt-laminated layers from 6-ply multiwall paper bag No. P-7, Table 1.

An examination of the data in Tables 1 and 2 show that the results obtained in the storage tests are in good agreement with what might have been expected from the quality of the bags as indicated by the photographs in Fig. 2.

New bags were used in all the storage tests and the only handling to which they were subjected was that incident to the filling and the closing of the bags. The primary object of the storage tests was to compare the permeability to water vapor of bags of different types and makes. It was thought inadvisable to make tests with used bags inasmuch as there was no way of knowing the relative degree of handling to which different bags had been subjected. Photographs made of bags indicate that their permeability to water vapor could be impaired by a moderate

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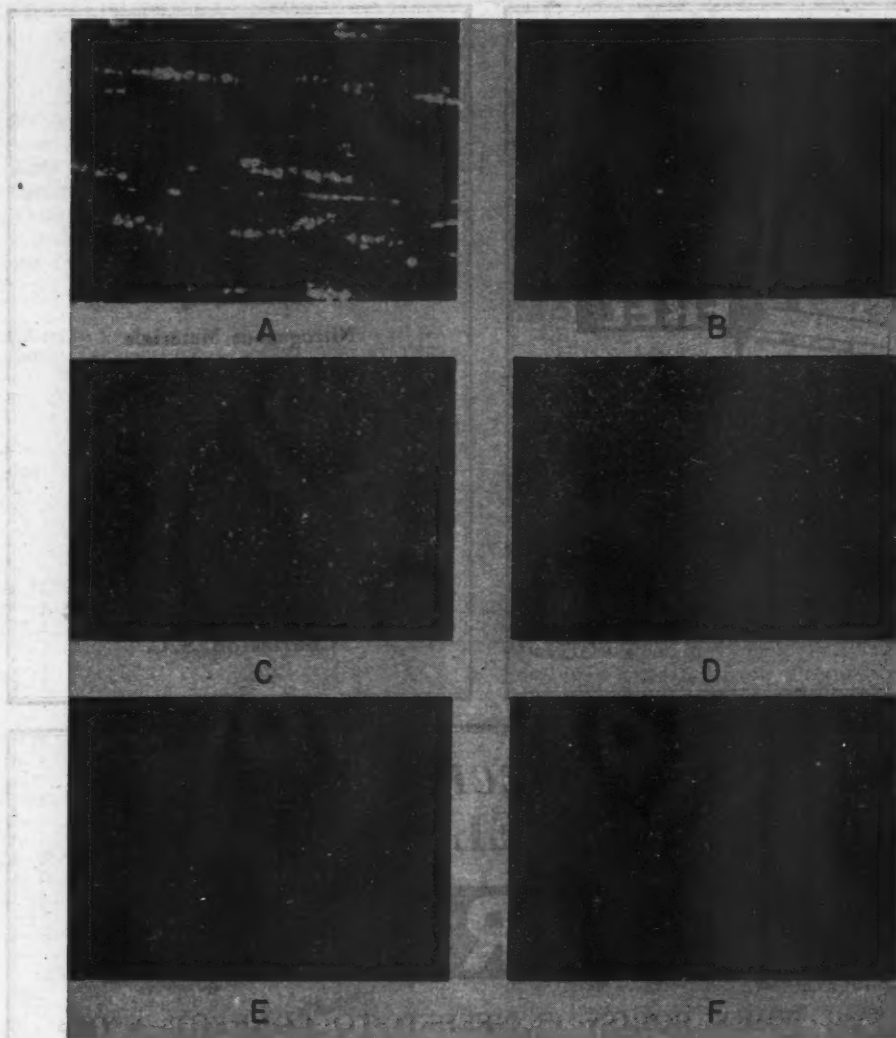


FIG. 2

Photographs of Light Transmitted Through
Bags of Different Types

A. Bag No. B-1, Table 2
C. Bag No. P-3, Table 1
E. Bag No. B-5Table, 2

B. Bag No. P-1, Table1
D. Bag No. P-5, Table 1, crumpled
F. Bag No. P-7, Table 1

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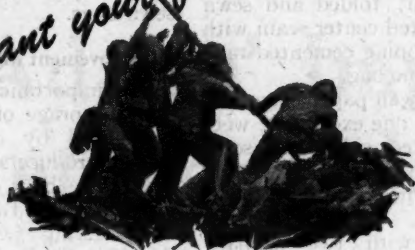
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- ★ Circulate envelopes for safekeeping of bonds.
- ★ Display 7th War Loan posters at strategic points.
- ★ And—see that a bench-to-bench, office-to-office 7th War Loan canvass is made.

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amount of rough handling. A paper bag that was originally of better quality than another might, therefore, show a less resistance to water vapor due to greater crumpling of the asphalt-laminated layers as a result of rough handling. It was felt that storage tests made with used bags might, therefore, lead to wrong conclusions respecting the relative merits of different makes of bags.

Bag Seams and Closures

The different methods used by the manufacturers in closing the bottom and sides of the burlap bags used in the storage tests are as follows: Cemented center seam with folded and sewn bottom; folded and sewn bottom and side; cemented center seam with sewn bottom and overlapping cemented tape of the same material as the bag.

All makes of the multiwall paper bags used in the storage tests, with one exception, were constructed with gusseted sides and sewn bottoms. The one exception was constructed in the form of a sack with cemented center seam and pasted bottom. The walls of these 5-ply multiwall bags with two asphalt-laminated layers were of very good quality but the bags were defective in that a water-soluble paste was used in closing the bottom of the bags. Openings for this reason frequently developed in the bottom of the bags thus causing leakage of water vapor.

All of the paper bags with self-forming gussets had cemented center seams. The different methods used in closing the bottom of the bags were as follows: sewn with cemented bound-over creped paper tape; sewn with cemented bound-over creped paper tape and wax dipped; sewn with cemented bound-over creped paper tape plus a second paper tape covering the needle thread; sewn with cemented bound-over creped paper tape plus a second paper tape covering the needle thread and wax dipped.

Two methods have so far been used in closing bags used in the shipment and storage of ammonium nitrate. These consist of wire ties and valve closures. Valve bags have proved satisfactory providing the valve is properly constructed and closed. If not properly closed, some of the ammonium nitrate will flow through the opening in the valve and spread over other bags in the same pile. In humid areas the spilled ammonium nitrate will liquefy and cause deterioration of the outer layers of the bags with which it comes in contact. Little or no leakage takes place from valve bags that are properly closed. Any leakage that takes place from

standard valve bags is due to carelessness or inexperience on the part of the workmen.

The use of wire ties for ammonium nitrate bags has the disadvantages that (1) they tend to slip off and cut the necks of the bags; (2) they rust and break, thereby allowing the ammonium nitrate to flow over and destroy other bags in turn (2); (3) they give a more or less rounded shape to the bags, thus increasing the difficulty of maintaining the bags in piles in an upright position; and (4) they frequently permit some leakage of water vapor through the closure. These disadvantages are so serious that the use of wire ties for ammonium nitrate bags is likely to be replaced in the future by valve or sewn bags.

Improvement in Bags for Ammonium Nitrate

The importance of the part played by bags in the storage of ammonium nitrate is now recognized by all the leading ammonium nitrate producers. Steps are now being taken to replace bags of the type represented by bag No. B-1, Table 2, with multiwall paper bags having two asphalt-laminated layers or their equivalent in burlap bags. The following are samples of specifications for bags that are considered to give satisfactory service in the storage of ammonium nitrate:

Multiwall Paper Bag (Reading from Inside to Outside)

5 wall construction
1 wall 75#-90# asphalt-laminated
2 walls 50# natural kraft
1 wall 75#-90# asphalt-laminated
1 wall 70# low stretch crepe
Sewn bottom and valve top, wax-dipped; water-proof glue in seams. Tuck-in-sleeve asphalt-laminated, or sewn closure wax dipped

Burlap Bag (Reading from Inside to Outside)

30% crinkled kraft
55% asphalt

(Continued on page 30)



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Cemented center seam; sewn and taped over bottom.

Closure sewn with bound-over crinkled paper tape, wax-dipped

For overseas shipment an extra layer of 40# natural kraft is preferably added on the inside of the multiwall paper bag. In the case of the burlap bag the central crinkled kraft and the outer burlap layers may be interchanged without having any appreciable effect on its permeability to water vapor.

It has also been recognized that the resistance of asphalt-lined bags to water vapor can be greatly impaired by filling the bags with ammonium nitrate at too high a temperature. This injury to ammonium nitrate bags is now being prevented by cooling the material to 40°C. (104°F.) or below before transferring it to the bags. It has further been observed that filling the bags too full, and the use of bags of unusually stiff walls increase the tendency of ammonium nitrate to cake.

The bags used in this investigation are considered to include types that will give satisfactory service in the shipment and storage of ammonium nitrate and at a price within the range considered reasonable by the fertilizer industry. Bags of still greater resistance to water and water vapor than any used in these tests can be prepared and are now being used in overseas shipments to the armed forces, but the cost of these bags would not seem to justify their use in the domestic shipment and storage of fertilizer materials.

Summary and Conclusion

1. Burlap and multiwall paper bags with two asphalt layers are at least twice as resistant to water vapor as the corresponding bags with one asphalt layer.

2. A modified laboratory water vapor permeability cell has been developed for determining the relative permeability of the walls of bags to water vapor transmission.

3. A method is described for comparing the quality of different bags by photographing light transmitted through them.

4. The extent to which conditioned ammonium nitrate undergoes caking in storage depends in large measure on the permeability to water vapor of the bags in which it is stored.

5. The resistance of asphalt-laminated paper bags to water vapor is impaired by rough handling and by filling them with material at too high a temperature.

6. The tendency of ammonium nitrate to

cake in storage is increased by filling the bags too full and by use of bags of unusually stiff walls.

7. The use of wire ties on bags is not as satisfactory for ammonium nitrate storage as valve or sewn closures.

8. The steps that have been taken in preparing ammonium nitrate for successful storage in humid sections of the country consist in drying and cooling the material to a temperature of about 40°C. (104°F.) or below, treating it with 3 to 4 per cent of a suitable conditioning agent, and storing in bags that are sufficiently moisture-resistant to keep the material dry throughout the period of storage. Bags that will comply with this specification are now available at a relatively low cost.

Acknowledgment

The authors gratefully acknowledge the assistance given by Katharine S. Love in determining moisture in the ammonium nitrate samples used in the tests. They wish also to express their appreciation to the Bemis Bro. Bag Co., the Chase Bag Co., the Raymond Bag Co., the St. Regis Paper Co., and the Union Bag Co. for supplying the different types of bags used in this investigation.

Literature Cited

- (1) Adams, J. Richard, and Merz, Albert R., *Ind. Eng. Chem.* **21**, 305-7 (1929).
- (2) Adams, J. Richard, Love, K. S., and Ross, Wm. H., U. S. Dept. Agr., Div. Soil and Fertilizer Investigations, *Research Report No. 26* (1944).
- (3) Carson, F. T., *J. Research, National Bureau of Standards* **18**, 235 (1937); *Paper Trade J.* **107**, 59-61 (1938).
- (4) Day, Preston C., U. S. Dept. Agr., *Monthly Weather Review, Supplement No. 6* (1917).
- (5) Fowle, Frederick E., *Smithsonian Physical Tables, 8th Ed.*, Table 212.
- (6) Ross, Wm. H., U. S. Dept. Agr., Div. Soil and Fertilizer Investigations, *Research Report No. 17* (1944).
- (7) Yee, J. Y., and Davis, R. O. E., *Ind. Eng. Chem., Anal. Ed.* **16**, 487-490 (1944).

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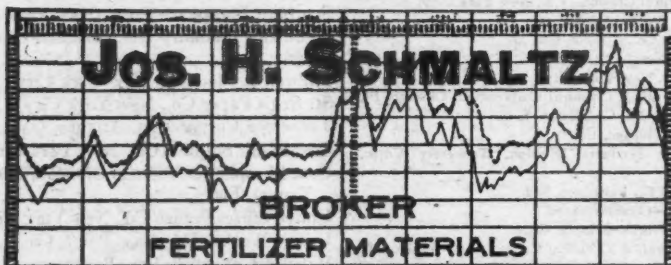
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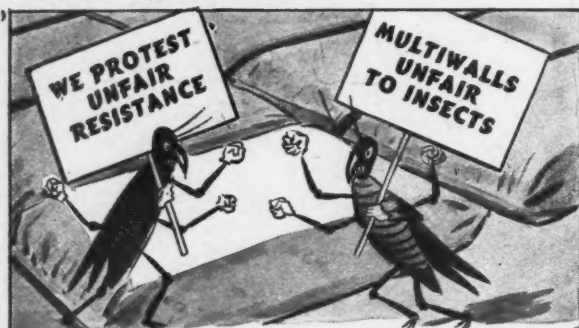
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